BRACE REGULATOR INSTALLATION


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ABSTRACT OF THE DISCLOSURE

A braking system for a railway car including a brake cylinder which is mounted on a railway car frame adjacent one end of the car, a double acting automatic brake regulator disposed adjacent thereto and connected therewith, triggering means for the regulator, and brake rigging for applying brake shoes to the wheels of the railway car.

This invention relates to braking systems and more particularly to improvements in such systems. Among many other possible uses, braking systems according to this invention are particularly desirable for use on railway freight cars, such as hopper cars.

It will be appreciated that hopper cars normally have sloping floor sheets for purposes of clearing the car of coal, or other lading, when the bottom doors are opened. Due to the fact that coal and similar lading is subject to freezing in the car during the winter months, it is often necessary to heat the car to free the lading therefrom. In this connection a number of different types of heating media are employed, such as a makeshift bonfire of scrap wood under the car, high intensity infra-red ray lamps located along the sides of the car as well as undercurber, and high intensity gas or gasoline burners located under the cars, for example. Any one of these methods of heating the cars may not only free the lading but also damage various parts of the car structure due to being operated at too high a temperature rating or for too long a period of time.

Hence, brake regulators, or slack adjusters, were located under the car in various positions from the bottom of the cylinder lever to and beyond the latitudinal center of the car. It will be appreciated that anything located in these positions is at the lowest point on the car structure, except for the loading shutes and doors, and therefore subject to heat damage. Further, it will be appreciated that practically all of the double acting brake regulators, or slack adjusters, employ loaded steel coil springs to actuate the brake rigging and remove any excessive slack. The coil springs are particularly vulnerable to heat and a spring annealed, due to excessive heating, renders the slack adjuster inoperative. When this occurs the device must be removed from the car, dismantled and the annealed spring replaced with a tempered spring, thereby causing an expense as well as a time delay.

Accordingly, a feature of the present invention is the provision of a new and improved braking system which overcomes the aforesaid difficulties encountered with such prior art systems.

As another feature of the invention, there is provided a new and improved braking system which is far superior to existing braking systems, and which is easy to install and operate.

Still another feature of this invention resides in the provision of a braking system which is reliable, compact and efficient.

In order to achieve the foregoing features, the invention contemplates the provision of a braking system comprising a brake cylinder assembly which is mounted on the railway car frame in a position adjacent one end of the car, and a brake regulator or slack adjuster disposed adjacent the same end of the railway car. Lever means are provided for interconnecting the brake regulator and the brake cylinder assembly. The braking system further comprises actuating means for the regulator, and means connected to the brake cylinder assembly for actuating brake means. These means include a body lever having a first end connected to said means connected to said brake cylinder, a truck lever connecting rod connected to the second end of said body lever. Further, a first truck lever is provided having one end connected to the truck lever connecting rod, and a bottom rod is connected to the other end of the first truck lever, and a brake shoe is connected to a central portion of the first truck lever. The braking system further includes a second truck lever having one end connected to the bottom rod, a fulcrum connecting rod connected to the other end of the second truck lever, a fulcrum member mounted on the center sill, the fulcrum connecting rod being pivotally attached to the fulcrum member. A second brake shoe is connected to a medial portion of the second truck lever.

There has thus been outlined rather broadly the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which this disclosure is based may readily be utilized as the basis for the designing of other structures for carrying out the several purposes of the invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of the invention.

Several embodiments of the invention have been chosen for purposes of illustration and description, and are shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a fragmentary side elevation of a railway car incorporating a braking system constructed in accordance with the concept of this invention;

FIG. 2 is an enlarged fragmentary side elevation of a portion of the braking system shown in FIG. 1, and showing in detail the brake cylinder assembly, cylinder lever and brake regulator;

FIG. 3 is a fragmentary plan view of the railway car of FIG. 1;

FIG. 4 is a fragmentary side elevation of a railway car showing a second embodiment of a braking assembly according to the concept of this invention;

FIG. 5 is a plan view of the railway car and braking system shown in FIG. 4;

FIG. 6 is a fragmentary side elevation of a railway car showing another embodiment of a braking system according to the invention;

FIG. 7 is an enlarged fragmentary plan view of the braking system of FIG. 6 and showing the brake cylinder assembly, brake regulator, bell crank and related parts;

FIG. 8 is a plan view of a railway car incorporating the braking system as shown in FIG. 6;

FIG. 9 is a fragmentary side elevation of a railway car showing still another embodiment of the braking system according to the invention; and

FIG. 10 is a fragmentary plan view of the railway car braking system of FIG. 9.

In the embodiment of the invention illustrated in FIGS. 1–3, the railway car may be of any conventional type such as one having a pair of side sills 10 and 12, FIG. 3, a center sill 14 and a horizontally disposed shear plate 16 connected to the sills. As best seen in FIG. 1, angularly disposed slope sheets 18 and 20 and a hopper
door 22 form the floor of the car, the angular disposition of these members being such as to allow the coal or other lading to flow through the hopper door during the unloading operation. A slope sheet support 24 is interposed between the shear plate 16 and the slope sheet 18 towards the end of the railroad car. At the end of the car, an end post 26 is provided which is attached to the upper surface of the center sill by an end sill 28. A striker 30 is attached to the end of the center sill 14, as shown in FIG. 2.

Still referring to the embodiment of the invention shown in FIGS. 1–3, the braking system includes a brake cylinder assembly 32 mounted on the shear plate 16 adjacent the slope sheet support 24. A cylinder lever 34 is pivotally connected to the brake cylinder assembly as at 36. The first end of a cylinder lever connecting rod 38 is pivotally connected to a medial portion of the cylinder lever 34 as at 40. A horizontally disposed body lever 42, FIG. 1, is provided having a first end which is pivotally connected to the second end of the cylinder lever connecting rod 38, as at 44.

As best seen in FIG. 1, a truck lever connecting rod 46 is pivotally connected to the second end of the body lever 42, as at 48. A center rod 50 is provided having one end pivotally attached to a medial portion of the body lever 42, as at 52.

Now referring to FIG. 1, there is shown a first truck lever 54 having the upper end pivotally connected to the truck lever connecting rod and the lower end pivotally connected to a bottom rod 56. A brake shoe 58 is mounted on a central portion of the first truck lever 54 for engaging the railroad car wheel 60 as shown in FIG. 1. A second truck lever 62 has one end thereof pivotally connected to the bottom rod 56 and the other end thereof is connected to a fulcrum connecting rod 64 which in turn is connected to a fulcrum member 66, the last named member being mounted on the center sill 14. A second brake shoe 68 is centrally mounted on the second truck lever 62 for engaging wheel 70.

As best seen in FIG. 2, a double acting automatic brake regulator or slack adjuster 72 is substantially vertically disposed and has its upper end pivotally attached, as at 74, to a fulcrum bracket 76 which is mounted on the end post 26. Any suitable type of brake regulator may be employed. However, preferred brake regulators are disclosed in the E. C. Mersereau Patent No. 3,001,612 and the Showers and Biscard Patent No. 3,096,859. A sheave bracket 78 is mounted on the lower side of the center sill 14 and carries a sheave 80. A chain 82 extends from the lower end of the brake regulator 72, around the sheave 80 to the lower end of the cylinder lever 34.

As best seen in FIG. 2, acting means for the double acting automatic brake regulator 72 includes a pull rod 84 having the upper end thereof attached to the regulator and having the lower end thereof attached to one arm of a bell crank 86, the bell crank being pivotally mounted on a fulcrum member 88 which, in turn, is mounted on the center sill 14. The other arm of the bell crank 86 is connected to the upper end of the cylinder lever 34 through a link member 90.

In operation, movement of the brake cylinder assembly 32 causes movement of the cylinder lever 34 which, in turn, moves the cylinder lever connecting rod 38, the body lever 42, truck lever connecting rod 46, truck lever 54, bottom rod 56, and truck lever 62, thereby actuating the brake shoes 58 and 68. It will be appreciated that movement of the cylinder lever 34 causes movement of the link 90, bell crank 86 and pull rod 84. This triggers the regulator 72 which causes it to either extend or contract as is dictated by the slack in the brake rigging. Such movement changes the position of the lower end of the cylinder lever 34 through the chain 82, thereby maintaining a fixed ratio of the movement of the brake cylinder assembly 32 with respect to the brake shoes 58 and 68 regardless of the amount of slack in the braking system.

To simplify the disclosure, like numerals identify similar parts throughout the drawings. In the embodiment of the invention illustrated in FIGS. 4 and 5, the railroad car may be of any conventional type such as that hereinbefore described in connection with FIGS. 1–3, except that the slope sheet 18 is supported by a slope sheet support bracket 92 which is interposed between the slope sheet 18 and the center sill 14. A braking cylinder assembly 32 is mounted on the shear plate 16, as best seen in FIG. 4. A substantially vertically disposed brake cylinder lever 96 is provided and the braking cylinder assembly is pivotally attached to a medial portion thereof as at 98. The cylinder lever connecting rod 90 is pivotally attached to the upper end of the brake cylinder lever 96, as at 100. The brake shoes 58 and 68 are actuated by movement of the cylinder lever connecting rod 90 through the various parts in the same manner as discussed more fully hereinbefore in connection with the embodiment of FIGS. 1–3.

A double acting automatic brake regulator 102 has its lower end pivotally attached to the slope sheet bracket as at 104, FIG. 4. Any suitable type of brake regulator may be employed such as the types described hereinbefore in connection with the brake regulator 72 in the embodiment of FIGS. 1–3. The regulator is positioned under the slope sheet 18 and is disposed in a substantially parallel relationship with respect thereto. A sheave bracket 106 is mounted on the underside of the slope sheet substantially adjacent the upper end of the regulator, and a sheave 108 is carried thereby. A chain 110 is employed extending from the upper end of the cylinder lever 96, partially along the sheave 108 and connecting to the upper end of the brake regulator 18, as shown in FIG. 4.

The actuating means for the brake regulator 102 includes a trigger 112 extending outwardly of the cylinder, a sheave 114 mounted on the center sill 14 adjacent the trigger and a cable 116 extending from the trigger, passing over the sheave and connected to the cylinder lever 96, as at 118.

In operation, movement of the brake cylinder assembly 32 causes movement of the cylinder lever 96 which, in turn, moves the cylinder lever connecting rod 38, the body lever 42, truck lever connecting rod 46, truck lever 54, bottom rod 56, and truck lever 62, thereby actuating the brake shoes 58 and 68. Movement of the cylinder lever 96 moves cable 116 to actuate trigger 112 which causes the regulator 102 to extend or contract depending upon the slack or lack of slack in the brake rigging. Such movement changes the position of the upper end of the cylinder lever 96 through the chain 110, thereby maintaining a fixed ratio of the movement of the brake cylinder assembly 32 with respect to the brake shoes 58 and 68 regardless of the amount of slack in the braking system.

As pointed out hereinbefore, to simplify the disclosure, like numerals identify similar parts throughout the drawings. In the embodiment of the invention illustrated in FIGS. 6–8, the railroad car may be of any conventional type such as that hereinbefore described in connection with FIGS. 1–3, except that the slope sheet 18 is supported by a slope sheet support 120 which is interposed between the slope sheet 18 and the center sill 14. A braking cylinder assembly 122 is mounted on the shear plate 16, as best seen in FIG. 6. A brake cylinder lever 124 is provided and the braking cylinder lever 124 is pivotally attached thereto, as at 126. The cylinder lever connecting rod 38 is pivotally attached to the lower end of the braking cylinder lever 124 as at 128. The brake shoes 58 and 68 are actuated by movement of the cylinder lever connecting rod 38 through the various parts in the same manner as discussed more fully hereinbefore in connection with the embodiment of FIGS. 1–3.

A substantially horizontally disposed double acting automatic brake regulator 130 extends crosswise of the
railway car and has its outside end attached to the side side sill 10 as at 131, FIG. 8. Any suitable type of brake regulator may be employed such as the types described hereinafter in connection with the brake regulator 72 in the embodiment of FIGS. 1–3. As best seen in FIG. 7, a rod 132 has one end pivotally connected to the other end of the regulator as at 134, and the other end thereof is pivotally connected to a bell crank 136, as at 138. The bell crank is pivotally mounted as at 140 on a bracket 142 extending from the end post 26. The other arm of the bell crank 136 operatively engages the upper end of the cylinder lever 124 as at 144.

As best seen in FIG. 7, the actuating means for the double acting automatic brake regulator includes a pull rod 146 having one end attached to the brake regulator as at 148, FIG. 8, and the other end thereof pivotally connected to one arm of a bell crank 148 as at 150. The other arm of the bell crank is pivotally connected to an actuator rod 152 as at 154, the actuator rod being attached to the cylinder lever as at 156, FIGS. 6 and 7.

As best seen in FIG. 6, a bracket 158 having a curved surface 160 is interposed between the slope sheet support 120 and the end post 26. The cylinder lever 124 is provided with a projecting pin 162 for engaging the curved surface 160 to support the cylinder lever in the desired vertical position with respect to its backward or forward position.

In operation, movement of the brake cylinder assembly 122 causes movement of the cylinder lever 124 which, in turn, moves the cylinder lever connecting rod 38, the body lever 42, truck lever connecting rod 46, truck lever 54, bottom rod 56, and truck lever 62, thereby actuating the brake shoes 58 and 68. Movement of the cylinder lever 124 moves actuator rod 152, bell crank 148 and pull rod 146 to cause the regulator 136 to extend or contract depending upon the slack or lack of slack in the brake rigging. Such movement changes the position of the upper end of the cylinder lever 124 through the crank 136 and rod 134, thereby maintaining a fixed ratio of the movement of the brake cylinder assembly 122 with respect to the brake shoes 58 and 68 regardless of the amount of slack in the braking system.

Again as pointed out hereinafter, to simplify the disclosure, like numerals identify similar parts throughout the drawings. In the embodiment of the invention illustrated in FIGS. 9 and 10, the railway car may be of any conventional type such as that hereinafter described in connection with FIGS. 1–3. As best seen in FIG. 9, a brake cylinder assembly 162 is mounted on the side of the slope sheet 18, as by means of an angle bracket 164. A bell crank bracket 166 is mounted on the under side of the slope sheet 18 adjacent the brake cylinder assembly 162, and a bell crank 168 is pivotally mounted thereon as at 179. One arm of the bell crank is pivotally connected to the brake cylinder assembly as at 172 and the other end thereof is pivotally attached to one end of a substantially vertically disposed double acting automatic brake regulator 174, as at 176. Any suitable type of brake regulator may be employed such as the types described hereinafter in connection with the brake regulator 72 in the embodiment of FIGS. 1–3.

As best seen in FIG. 9, a second bell crank bracket 178 is mounted on the top of the center sill 14, and a second bell crank 180 is pivotally mounted thereon as at 182. One arm of the bell crank is pivotally attached to the lower end of the brake regulator 174 as at 184, and the other arm thereof is pivotally attached to the first end of a cylinder and brake regulator connecting rod 186 as at 188. The second end of the rod 186 is connected to the first end of the body lever 188 as seen in FIG. 3. The brake shoes 58 and 68 are actuated by movement of the body lever 42 through various parts in the same manner as discussed more fully hereinafter in connection with the embodiment of FIGS. 1–3.

As best seen in FIG. 9, the actuating means for the double acting automatic brake regulator includes a trigger 188 projecting from the double acting automatic brake regulator 174 which engages a trigger actuating bracket 190 mounted on the end post 26.

In operation, movement of the brake cylinder assembly 162 causes movement of said body lever 188, which, in turn, moves the brake regulator 174, bell crank 180, cylinder and brake regulator connecting rod 186, body lever 42, truck lever connecting rod 46, truck lever 54, bottom rod 56, and truck lever 62, thereby actuating the brake shoes 58 and 68. Movement of the brake regulator 174 causes movement of the trigger 188 due to its engagement with trigger actuating bracket 190, thereby causing the regulator 174 to extend or contract depending upon the slack or lack of slack in the brake rigging. This movement changes the length of the brake regulator 174 which in effect acts as a link in the system, and thereby maintains a fixed ratio of movement of the brake cylinder assembly 162 with respect to the brake shoes 58 and 68 regardless of the amount of slack in the braking system.

It will thus be seen that the present invention does indeed provide an improved braking system wherein the major braking parts are located towards the end of the railway car, thereby removing them from the point of application of heat utilized for discharging the laden in the car.

Although particular embodiments of the invention are herein disclosed for purposes of explanation, various modifications thereto will be apparent to those skilled in the art to which the invention pertains, reference should accordingly be had to the appended claims in determining the scope of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. In a railway car of the character described, a braking system comprising a brake cylinder assembly mounted on the car frame adjacent one end thereof, a brake regulator disposed adjacent said one end of the railway car, lever means interconnecting said brake regulator and said brake cylinder assembly, actuating means for said regulator, means connected to said brake cylinder assembly for actuating brake means, said brake means including a body lever having a first end connected to said means connected to said brake cylinder, a truck lever connecting rod connected to the second end of said body lever, a first truck lever having one end connected to said truck lever connecting rod, a bottom rod connected to the other end of the second truck lever, a brake shoe connected to a central portion of the first truck lever, a second truck lever having one end connected to said bottom rod, a fulcrum connecting rod connected to the other end of the second truck lever, a fulcrum member mounted on the center sill, the fulcrum connecting rod being pivotally attached to the fulcrum member, and a second brake shoe connected to a medial portion of the second truck lever.

2. In a railway car having a car frame including a pair of side sills, a center sill, slope sheets, an end post, an end sill interconnecting said end post and said center sill, a braking system comprising a brake cylinder assembly mounted on the car frame adjacent one end thereof, a brake regulator disposed adjacent said one end of the railway car, lever means interconnecting said brake regulator and said brake cylinder assembly, actuating means for said regulator for causing said regulator to extend and contract as is directed by the slack in the braking system, means connected to said brake cylinder assembly for actuating brake means, said brake means including a body lever having a first end connected to said means connected to said brake cylinder, a truck lever connecting rod connected to the second end of said body lever, a first truck lever having one end pivotally attached to a medial portion of the body lever, a first truck lever having one end connected to said truck lever connecting rod, a bottom rod having its outside end attached to the side side sill 10 as at 131, FIG. 8. Any suitable type of brake regulator may be employed such as the types described hereinafter in connection with the brake regulator 72 in the embodiment of FIGS. 1–3.

3. As best seen in FIG. 9, a second bell crank bracket 178 is mounted on the top of the center sill 14, and a second bell crank 180 is pivotally mounted thereon as at 182. One arm of the bell crank is pivotally attached to the lower end of the brake regulator 174 as at 184, and the other arm thereof is pivotally attached to the first end of a cylinder and brake regulator connecting rod 186 as at 188. The second end of the rod 186 is connected to the first end of the body lever 188 as seen in FIG. 3. The brake shoes 58 and 68 are actuated by movement of the body lever 42 through various parts in the same manner as discussed more fully hereinafter in connection with the embodiment of FIGS. 1–3.
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In a railway car having a pair of side sills, a center sill, a shear plate connected to said sill, slope sheets, a hopper door disposed at the lower end of said slope sheets, a slope sheet support interposed between said slope sheet and the slope sheet support, at the lower end of said car, an end post, an end sill interconnecting said end post and said center sill, a braking system comprising a brake cylinder assembly mounted on said shear plate adjacent said slope sheet support, a cylinder lever having the upper end connected to said brake cylinder assembly, a cylinder lever connecting rod having one end connected to a medial portion of said cylinder lever, a body lever having a first end connected to the second end of said cylinder lever connecting rod, a truck lever connecting rod connected to the second end of said body lever, a center rod having one end pivotally attached to a medial portion of said body lever, a first truck lever having one end connected to said truck lever connecting rod, a bottom rod connected to the other end of said first truck lever, a brake shoe connected to a central portion of the first truck lever, a brake shoe connected to the other end of said truck lever, a fulcrum member mounted on the center sill, the fulcrum connecting rod being pivotally attached to the fulcrum member, and a second brake shoe connected to a medial portion of the second truck lever.

9. In a railway car having a pair of side sills, a center sill, a shear plate connected to said sill, slope sheets, a hopper door disposed at the lower end of said slope sheets, a slope sheet support interposed between said slope sheet and the slope sheet support, at the lower end of said car, an end post, an end sill interconnecting said end post and said center sill, a braking system comprising a brake cylinder assembly mounted on said shear plate adjacent said slope sheet support, a cylinder lever having the upper end connected to said brake cylinder assembly, a cylinder lever connecting rod having one end connected to a medial portion of said cylinder lever, a body lever having a first end connected to the second end of said cylinder lever connecting rod, a truck lever connecting rod connected to the second end of said body lever, a center rod having one end pivotally attached to a medial portion of said body lever, a first truck lever having one end connected to said truck lever connecting rod, a bottom rod connected to the other end of said first truck lever, a brake shoe connected to a central portion of the first truck lever, a brake shoe connected to the other end of said truck lever, a fulcrum member mounted on the center sill, the fulcrum connecting rod being pivotally attached to the fulcrum member, and a second brake shoe connected to a medial portion of the second truck lever.
on the center sill adjacent said trigger, a cable extending from said trigger, passing over said second sheave and connected to the cylinder lever.

12. A braking system according to claim 11 wherein said means comprises a cylinder lever connecting rod having a first end pivotally connected to the lower end of said cylinder lever, a body lever having a first end connected to the second end of said cylinder lever connecting rod, a truck lever connecting rod connected to the second end of said body lever, braking means connected to the other end of the truck lever connecting rod.

13. A braking system according to claim 11 wherein said braking means comprises a first and an oppositely disposed second truck lever, said first truck lever having one end connected to said truck lever connecting rod, a bottom rod connected to the other end of said first truck lever, one end of said second truck lever being connected to said bottom lever, brake shoes connected to the central portions of said first and second truck levers respectively, a fulcrum connecting rod connected to the other end of the second truck lever, a fulcrum member mounted on the center sill, the fulcrum connecting rod being pivotally connected to a medial portion of said body lever, a truck lever connecting rod connected to the second end of said body lever, a first end and an oppositely disposed second truck lever, said first truck lever having one end connected to said truck lever connecting rod, a bottom rod connected to the other end of said first truck lever, one end of said second truck lever being connected to said bottom lever, brake shoes connected to the central portions of said first and second truck lever respectively, a fulcrum connecting rod connected to the other end of said truck lever, a fulcrum member mounted on the center sill, the fulcrum connecting rod being pivotally attached to the fulcrum member, a double acting automatic brake regulator having the lower end connected to said slope sheet bracket under the slope sheet, said regulator being substantially parallelly disposed with respect to said slope sheet, a sheave bracket mounted on the under side of said slope sheet substantially adjacent the upper end of the regulator, a sheave carried by said sheave bracket, a chain extending from the upper end of the cylinder lever, passing over said sheave and connected to the upper end of said brake regulator, actuating means for said regulator including a trigger mounted on the regulator, a second sheave mounted on the center sill adjacent said trigger, a cable extending from said trigger, passing over said second sheave and connected to a medial portion of the cylinder lever.

15. In a railway car of the character described, a braking system comprising a brake cylinder assembly mounted on the car frame adjacent one thereof, a cylinder lever, said brake cylinder assembly being pivotally connected to a medial portion of said cylinder lever, means connected to said cylinder lever for actuating brake means, a brake regulator extending crosswise of said railway car adjacent said one end, said regulator having one end connected to said frame, linkage means interconnecting the other end of said brake regulator to the cylinder lever, actuating means interconnecting said brake regulator and said cylinder lever.

16. A braking system according to claim 15 wherein said linkage means interconnecting the other end of said brake regulator to the cylinder lever comprises a rod having one end connected to the other end of said regulator, a belt crank having one arm connected to the other end of said rod, the other arm of the belt crank being connected to the upper end of the cylinder lever.

17. A braking system according to claim 15 wherein said actuating means interconnecting said brake regulator and said cylinder lever comprises a pull rod having one end attached to the regulator, an actuator rod connected to the cylinder lever, and a bell crank interconnecting the pull rod and the actuator rod.

18. In a railway car having a center sill, a pair of side sills, a sheave plate connected to said sills adjacent one end of the car, a braking system comprising a brake cylinder assembly mounted on the shear plate, a cylinder lever, said brake cylinder assembly being pivotally connected to a medial portion of said cylinder lever, means connected to said cylinder lever for actuating brake means, a substantially horizontally disposed double acting automatic brake regulator extending crosswise of said railway car adjacent said one end, said regulator having one end connected to one of said side sills, said rod having one end connected to the other end of said regulator, a bell crank having one arm connected to the other end of said rod, the other arm of the bell crank being operatively connected to the upper end of the cylinder lever, a pull rod having one end attached to the regulator, an actuator rod connected to the cylinder lever, a second bell crank interconnecting the pull rod and the actuator rod.

19. A braking system according to claim 18 further comprising an end post, an end sill interconnecting said end post and said center sill, a curved bracket connected to said end post, a pin projecting from said cylinder lever for engaging the curved bracket for supporting the cylinder lever.

20. A braking system according to claim 18 further comprising an end post, an end sill interconnecting said end post and said center sill, an angularly disposed slope sheet, a slope sheet support being supported on said end post and the center sill, a bracket having a curved surface, said last named bracket being connected to the slope sheet support and the end post, a pin projecting from said cylinder lever for engaging said curved surface to support the cylinder lever.

21. A braking system according to claim 18 wherein said means comprises a cylinder lever connecting rod having one end connected to the lower end of said cylinder lever, a body lever having a first end connected to the other end of said cylinder lever connecting rod, a truck lever connecting rod connected to the second end of said body lever, braking means connected to the other end of the truck lever connecting rod.

22. A braking system according to claim 21 wherein said braking means comprises a first truck lever having one end connected to said truck lever connecting rod, a bottom rod connected to the other end of said first truck lever, a brake shoe connected to a central portion of the first truck lever, a second truck lever having one end connected to said bottom rod, a fulcrum connecting rod connected to the other end of said second truck lever, a fulcrum member mounted on the center sill, the fulcrum connecting rod being pivotally connected to the fulcrum member, and a second brake shoe connected to a medial portion of the second truck lever.

23. In a railway car having a center sill, a pair of side sills, a sheave plate connected to said sills adjacent one end of the car, an end post, an end sill interconnecting said
end post and said center sill, an angularly disposed slope sheet, a slope sheet support interconnecting the slope sheet and the center sill, a bracket having a curved surface, said last named bracket being connected to the slope sheet support and the end post, a braking system comprising a brake cylinder assembly mounted on the slope plate, a vertically disposed cylinder lever, said brake cylinder assembly being pivotally connected to a medial portion of said cylinder lever, a cylinder lever connecting rod having one end connected to the lower end of said cylinder lever, a body lever having one end connected to the other end of said cylinder lever, connecting rod, a truck lever connecting rod connected to the second end of said body lever, a center rod having one end pivotally attached to a medial portion of said body lever, a first truck lever connecting rod connected to the other end of said center sill, a brake shoe connected to the lower end of said brake regulator, said brake regulator being extensible and retractable between said first bell crank and said second bell crank for eliminating the slack and controlling the travel of the braking system, means connected to said end post and bell crank for actuating brake means, and means for triggering said regulator.

27. A braking system according to claim 26 wherein said means for actuating said brake regulator comprises a trigger mounted on said regulator, and a trigger actuating bracket fixedly mounted on said end post adjacent said regulator for engaging said trigger.

28. A braking system according to claim 26 wherein said means connected to the other arm of said second bell crank for actuating brake means comprises a cylinder and brake regulator connecting rod having one end connected to the other arm of said second bell crank, a body lever having one end connected to the second end of said cylinder lever and brake lever connecting rod, a truck lever connecting rod connected to the second end of said body lever, a center rod having one end pivotally attached to a medial portion of said body lever, a braking means connected to the other end of the truck lever connecting rod.

29. A braking system according to claim 26 wherein said means comprises a first truck lever having one end connected to said truck lever connecting rod, a bottom rod connected to the other end of said first truck lever, a brake regulator extending crosswise of said railway car adjacent said one end, said regulator having one end connected to one of said sidewalks, a rod having one end connected to the other end of said regulator, an actuator rod connected to the cylinder lever, a second bell crank connecting the pull rod and the actuator rod, and a pin projecting from said cylinder lever for engaging said curved surface to support the cylinder lever.

30. A braking system according to claim 26 wherein said brake cylinder assembly is mounted on the under side of said slope sheet, and wherein said first mentioned bell crank bracket is mounted on the under side of said slope sheet.

31. In a railway car having a center sill, an angularly disposed slope sheet positioned towards one end of said car, an end post, an end post sill interconnecting said end post and said center sill, a braking system comprising a brake cylinder assembly mounted on said slope sheet, a brake cylinder assembly mounted on said second end of said brake regulator, said brake regulator being extensible and retractable between said first bell crank and said second bell crank for eliminating the slack and controlling the travel of the braking system, means connected to the other arm of said second bell crank for actuating brake means, and means for triggering said regulator.

32. A braking system according to claim 24 wherein said means for actuating said regulator comprises a trigger connected to the lower end of said brake regulator, said brake regulator being extensible and retractable between said first bell crank and said second bell crank for eliminating the slack and controlling the travel of the braking system, means connected to the other arm of said second bell crank for actuating brake means, and means for triggering said regulator.

33. A braking system according to claim 24 wherein said means for actuating said regulator comprises a trigger mounted on said regulator, and a trigger actuating bracket fixedly mounted on said end post adjacent said regulator for engaging said trigger.
center sill, the fulcrum connecting rod being pivotally attached to the fulcrum member, and a second brake shoe connected to a medial portion of the second truck lever, a trigger mounted on said regulator, and a trigger actuating bracket fixedly mounted on said end post adjacent said regulator for engaging said trigger.